

IN THE CLAIMS:

- 1 1. (Currently Amended): A computer implemented method for managing data to be
2 written to a file served by a storage system while the file is undergoing a write allocation
3 procedure, the method comprising the steps of:
4 receiving a write operation comprising data to be written to the file;
5 associating the received data with a buffer data control structure associated with
6 the file; and
7 marking the buffer data control structure associated with the file as being dirty for
8 a next consistency point.
- 1 2. (Currently Amended): The computer implemented method of claim 1 wherein the
2 buffer data control structure comprises a first data pointer and a second data pointer.
- 1 3. (Currently Amended): The computer implemented method of claim 1 wherein the
2 step of associating the received data with the buffer data control structure further com-
3 prises a step of setting a pointer in the buffer data control structure to a memory location
4 associated with the received data.
- 1 4. (Currently Amended): The computer implemented method of claim 1 wherein the
2 step of marking the buffer data control structure associated with the file as being dirty for
3 a next consistency point comprises the step of setting a flag in a flags array of the buffer
4 data control structure.
- 1 5. (Currently Amended): The computer implemented method of claim 1 wherein the
2 buffer data control structure comprises a flags array, the flags array having entries associ-
3 ated with a current consistency point and with a next consistency point.

1 6. (Currently Amended): The computer implemented method of claim 5 wherein entries
2 associated with a current consistency point are accessed by indexing into the flags array
3 using a value calculated by performing a logical AND operation on a consistency point
4 counter and a value of 1.

1 7. (Currently Amended): The computer implemented method of claim 6 wherein the
2 consistency point counter is monotonically increasing value that identifies a current con-
3 sistency point.

1 8. (Currently Amended): The computer implemented method of claim 5 wherein entries
2 associated with a next consistency point are accessed by indexing into the flags array us-
3 ing a value calculated by subtracting from a value of 1 a result of performing a logical
4 AND operation on a consistency point counter and a value of 1.

1 9. (Currently Amended): The computer implemented method of claim 8 wherein the
2 consistency point counter is a monotonically increasing value that identifies a current
3 consistency point.

1 10. (Currently Amended): The computer implemented method of claim 5 wherein entries
2 associated with the current consistency point and the next consistency point are differen-
3 tiated by performing modulo two addition to a consistency point counter.

1 11. (Currently Amended): The computer implemented method of claim 10 wherein the
2 consistency point counter is monotonically increasing.

1 12. (Original): A storage system for using a networked environment capable of accepting
2 write operations directed to files currently undergoing a write allocation procedure, the
3 storage system comprising:

4 means for receiving write operations containing data directed to the file;

5 means for associating the received data with a buffer data control structure; and
6 means for marking the buffer data control structure as being dirty for a next con-
7 sistency point.

1 13. (Original): The storage system of claim 12 wherein ~~the~~ means for associating the re-
2 ceived data with a buffer data control structure comprises means for setting a pointer in
3 the buffer data control structure.

1 14. (Original): The storage system of claim 10 wherein a second pointer in the buffer
2 data control structure points to data already written to the file.

1 15. (Currently Amended): A storage system adapted to enable write operations to a file
2 undergoing write allocation, the storage system comprising:

3 a write allocation process of a file system, the write allocation process adapted to
4 associated received file data with a buffer data control structure upon receipt of a write
5 operation directed to the file while the file is undergoing write allocation.

1 16. (Currently Amended): The storage system of claim 15 wherein the buffer data con-
2 trol structure comprises a flags array having an entry associated with a current consis-
3 tency ~~point~~ point and an entry associated with a next consistency point.

1 17. (Original): The storage system of claim 16 wherein the entry associated with the cur-
2 rent consistency point is identified by performing addition modulo addition to a consis-
3 tency point counter.

1 18. (Original): The storage system of claim 16 wherein the entry associated with the next
2 consistency point counter is identified by performing addition modulo two to a consis-
3 tency point counter.

1 19. (Original): The storage system of claim 16 wherein the entry associated with the cur-
2 rent consistency point is accessed using an index value calculated by performing a logical
3 AND operation on a consistency point counter and a value of 1.

1 20. (Original): The storage system of claim 16 wherein the entry associated with the next
2 consistency point is accessed using an index value calculated by subtracting from a value
3 of 1 a result of performing a logical AND operation on a consistency point counter and a
4 value of 1.

1 21. (Original): A method for managing data to be written to a file while the file is under-
2 going a write allocation procedure, the method comprising the steps of:
3 determining if the buffer is dirty for a current consistency point;
4 performing, in response to determining that the buffer is dirty for the current con-
5 sistency point, write allocation of a buffer associated with the file for a current consis-
6 tency point; and
7 freeing, if the buffer is dirty for a next consistency point, data written during the
8 step of write allocation.

1 22. (Original): The method of claim 21 wherein the step of determining if the buffer is
2 dirty for a current consistency point further comprises the step of examining a flag in a
3 buffer data control structure associated with the buffer.

1 23. (Original): The method of claim 22 wherein the flag is an entry in a flags array stor-
2 ing entries for the next consistency point and the current consistency point.

1 24. (Original): The method of claim 23 wherein the entry for the next consistency point
2 is identified by performing addition modulo two to a consistency point counter.

1 25. (Original): The method of claim 23 wherein the entry for the current consistency
2 point is identified by performing addition modulo two to a consistency point counter.

1 26. (Original): The method of claim 21 further comprising the step of increasing a con-
2 sistency point counter.

1 27. (Currently Amended): A computer implemented buffer data control structure for use
2 in a storage operating system permitting write operations to files undergoing a write allo-
3 cation procedure, the buffer data control structure comprising:

4 a flags array having entries for flags associated with a current consistency point
5 and entries associated with a next consistency point;

6 a first data pointer pointing to file data associated with the current consistency
7 point; and

8 a second data pointer pointing to file data associated with the next consistency
9 point.

1 28. (Currently Amended): The computer implemented buffer data control structure of
2 claim 27 wherein the flags associated with a current consistency point are identified by
3 performing addition modulo two to a consistency point counter.

1 29. (Currently Amended): The computer implemented buffer data control structure of
2 claim 27 wherein the flags associated with the next consistency point are identified by
3 performing addition modulo two to a consistency point counter.

Please add new claims 30, et seq. as follows:

- 1 30. (New): A computer implemented method for processing a write operation to a file,
2 while the file is undergoing a write allocation procedure, without delaying the write op-
3 eration, the method comprising the steps of:
4 receiving the write operation and information associated therewith, the write
5 operation directed to the file to be written to during a next consistency point; and
6 differentiating the information associated with the write operation from in-
7 formation currently undergoing write operation.
- 1 31. (New): The computer implemented method of claim 30 wherein the step of differen-
2 tiating further comprises the step of modifying an inode associated with the file.
- 1 32. (New): The computer implemented method of claim 31 wherein the inode comprises
2 an in core section and an on disk section.
- 1 33. (New): The computer implemented method of claim 31 wherein the step of modify-
2 ing the inode further comprises the step of modifying a flag in a flag field of the inode.
- 1 34. (New): The computer implemented method of claim 33 wherein the modified flag
2 indicates that the file was modified during a consistency point.
- 1 35. (New): The computer implemented method of claim 33 wherein the step of modify-
2 ing the inode further comprises the step of modifying a shadow index associated with the
3 information.

1 36. (New): A computer system for processing a write operation to a file, while the file is
2 undergoing a write allocation procedure, without delaying the write operation, the system
3 comprising:

4 means for receiving the write operation and information associated
5 therewith, the write operation directed to the file to be written to during a next consis-
6 tency point; and

7 means for differentiating the information associated with the write operation
8 from information currently undergoing write operation.

1 37. (New): The computer system of claim 36 wherein means for differentiating further
2 comprises means for modifying an inode associated with the file.

1 38. (New): The computer system of claim 37 wherein the inode comprises an in core
2 section and an on disk section.

1 39. (New): The computer system of claim 37 wherein means for modifying the inode
2 further comprises means for modifying a flag in a flag field of the inode.

1 40. (New): The computer system of claim 39 wherein means for modifying the flag fur-
2 ther comprises means for indicating the file was modified during a consistency point.

1 41. (New): The computer system of claim 39 wherein means for modifying the inode
2 further comprises means for modifying a shadow index with the information.